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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/516,849

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Kenichiro Miyahara

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EXAMINER

AUSTIN, AARON

ART UNIT

PAPER NUMBER

1775

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/516,849

Applicant(s)

MIYAHARA, KENICHIRO

Examiner

Aaron S. Austin

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-45 is/are pending in the application.
- 4a) Of the above claim(s) 39-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-38 is/are rejected.
- 7) ☒ Claim(s) 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Newly submitted claims 39-45 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the claims are directed to a process for producing a thin film rather than a substrate for a thin film as originally claimed.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 39-45 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Terminal Disclaimer

The terminal disclaimer filed on 11/27/06 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on pending Application No. 11/320,873 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Objections

Claim 26 is objected to because of the following informalities: the phrasing of the claim is confusing as the elements are not clearly set forth in their relation to each other. Particularly, the claim begins "A substrate for a thin film which comprises" and it is

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unclear as to whether the terms "which comprises" in line 1 modifies the substrate or the thin film. It is requested that the elements be separated to more clearly set forth the subject matter of the claim. Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. 37 CFR 1.75(i), MPEP 608.01(m). Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 26-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between the substrate claimed and the thin film. In particular, the claim begins "A substrate for a thin film which comprises". It is unclear as to whether the terms "which comprises" in line 1 modify the substrate or the thin film. For purposes of examination the terms "which comprises" in line 1 are interpreted as modifying the thin film as it appears to relate to a single-crystal thin film.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 26-33 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Taniguchi et al. (JP01-103961).

Please note, the present claims are directed to a substrate for thin film formation. Therefore, the application of the thin film and its associated limitations are considered intended use.

Taniguchi et al. teach an AlN sintered compact suitable for thin film formation having a surface roughness of 1 micrometer or less (translation, page 2/9).

Regarding claims 27-31 and 35, these claims are directed to limitations on the thin film to be applied to the claimed substrate. As claim 26 does not require the presence of the thin film, but is instead directed to the substrate itself, the thin film and its associated limitations are considered intended use.

Regarding claim 32, the sintered compact comprises AlN (abstract).

Regarding claim 33, the sintered compact has a surface roughness of 1 micrometer or less (translation, page 2/9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 26- are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US Patent No. 6,001,748) in view of Taniguchi et al. (JP01-103961).

Please note, the present claims are directed to a substrate for thin film formation. Therefore, the application of the thin film and its associated limitations are considered intended use.

Tanaka et al. teach aluminum, gallium and indium crystal nitride layers formed on the surface of a substrate composed of a sintered product of aluminum nitride, silicon carbide, or sapphire (column 6, lines 32-65; claims 6 and 19). The crystal's structure is of the wurtzite type, thereby having a hexagonal structure (column 6, lines 53-65).

Tanaka et al. do not teach the surface roughness of the substrate.

Taniguchi et al. teach an AlN sintered compact having a surface roughness of 1 micrometer or less (translation, page 2/9). Therefore, as Taniguchi et al. clearly teach a small surface roughness provides the advantage of reduced or eliminated surface polishing after sintering, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the sintered compact of Tanaka et al. having a small surface polish is the range of 1 micrometer or less as taught by Taniguchi et al.

Regarding claims 27-31 and 35, these claims are directed to limitations on the thin film to be applied to the claimed substrate. As claim 26 does not require the presence of the thin film, but is instead directed to the substrate itself, the thin film and its associated limitations are considered intended use.

Regarding claim 27, the term "closely" is a relative term. As the thin film taught by Tanaka et al. are in direct proximity to the substrate, they are considered to be formed "closely" within the meaning of the claim.

Regarding claim 28, as like materials are used in a like manner, the junction strength between layers is considered to overlap the claimed range.

Regarding claim 29, the half width value of the rocking curve is not more than 5 min. (claim 2).

Regarding claim 30, the method of measuring the rocking curve is not considered to provide patentable weight to the physical structure of the claimed substrate.

Regarding claims 31 and 33, Taniguchi et al. teach the benefits of a surface roughness of 1 micrometer or less as set forth above (translation, page 2/9).

Regarding claim 32, the sintered compact comprises AlN (column 6, lines 32-65; claims 6 and 19).

Regarding claims 34 and 38, Taniguchi et al. teach aluminum, gallium and indium crystal nitride layers formed on the surface of a substrate composed of a sintered product of aluminum nitride (column 6, lines 32-65; claims 6 and 19).

Regarding claim 37, as like materials are used in a like manner as claimed, the specific resistance of the sintered compact is expected overlap the claimed range.

Response to Arguments

Applicant's arguments filed 11/27/06 have been fully considered but they are not persuasive.

With respect to the Tanaka et al. reference, applicant argues Tanaka et al. teaches away from a small size crystal pointing to column 6, lines 1-6 for support. However, as "small" and "large" are relative terms, this argument is not found to be convincing. Particularly, the present claims do not limit crystal size. Thus the arguments are not commensurate with the claims. Tanaka et al. do teach a single crystal layer as claimed.

Even further, claim 26 does not require the presence of the thin film, but is instead directed to the substrate itself. The thin film and its associated limitations are therefore considered intended use. It is the examiner's position that the substrate of Tanaka et al. is suitable for application of a thin film as claimed, therefore the arguments are not found to be persuasive.

Applicant's arguments with respect to the remaining references have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

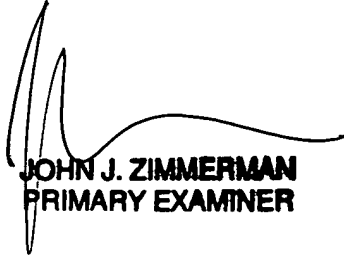
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron S. Austin whose telephone number is (571) 272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASA



JOHN J. ZIMMERMAN
PRIMARY EXAMINER